IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Niclas Wiberg, *et al.*	§
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Application No	10/596,613	§
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Filed:	06/19/2006	§
		§
		§

Group Art Unit: 2611

Examiner: SYED HAIDER

Confirmation No: 8421

Attorney Docket No: P18737-US1
Customer No.: 27045

For: Adaptive Channel Measurement Reporting

Via EFS-Web

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Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313.1450

APPEAL BRIEF SUBMITTED UNDER 35 U.S.C. §134

This Appeal Brief is submitted to appeal the decision of the Primary Examiner, set forth in the Final Official Action dated December 16, 2009, finally rejecting claims 26-38, 46 and 47, and the Advisory Action, dated March 1, 2010, maintaining the claim rejections.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §41.20(b)(2), and to credit any overpayment, to Deposit Account No. 50-1379.

Real Party in Interest

The real party in interest, by assignment, is: Telefonaktiebolaget LM Ericsson (publ)
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Stockholm, Sweden

Related Appeals and Interferences

None.

Status of Claims

Claims 1-25, 40-45 and 48-50 were previously cancelled and are not appealed. Claims 26-39, 46 and 47 remain pending, each of which are finally rejected and form the basis for this Appeal.

Status of Amendments

The claims set out in the Claims Appendix include all entered amendments. No amendment has been filed subsequent to the final rejection.

Summary of Claimed Subject Matter

Claim Element	Specification Reference
26. A method in a receiver unit to receive communication signals from a transmitter unit via a multi-path channel, said method comprising the steps of:	Page 4, line 16 – Page 5, line 15 Figures 1, 2
estimating parameters of a channel filter function of said channel from said received communication signals from the transmitter unit;	Page 5, line 24, *et seq.*
sub-dividing the channel filter function into two or more parts, a function of which representing an approximation of the estimated full channel filter function;	Page 6, line 6, *et seq.*
representing the complex parameters of at least a selection of said parts of the channel filter function as actual parameter values, or as incremental values indicating the difference to a reference value; and,	Page 7, line 26, *et seq.*
composing a channel measurement message to be transmitted to the transmitter unit of a portion including said parameter representations and a portion indicating the manner of representing said parameters.	Page 9, line 31, *et seq.*

Claim Element	Specification Reference
46. An apparatus for processing communication signals received via a multipath channel, comprising:	Page 4, line 16 – Page 5, line 15 Figures 1, 2
means for estimating parameters of a	Page 5, line 24, *et seq.*

channel filter function of said channel from said received communication signals from the transmitter unit;	
means for sub-dividing the channel filter function into two or more parts, a function of which representing the estimated full channel filter function;	Page 6, line 6, *et seq.*
means for representing the complex parameters of at least a selection of the sub-divided channel filter function as actual parameter values, or as incremental values indicating the difference to a reference value; and,	Page 7, line 26, *et seq.*
means for composing a channel measurement message to be transmitted to the transmitter unit including said set of parameter representations and a header field indicating the manner of representing said parameters.	Page 9, line 31, *et seq.*

The specification references listed above are provided solely to comply with the USPTO's current regulations regarding appeal briefs. The use of such references should not be interpreted to limit the scope of the claims to such references, nor to limit the scope of the claimed invention in any manner.

Grounds of Rejection to be Reviewed on Appeal

1.) Whether claims 26-39, 46 and 47 are unpatentable, under 35 U.S.C. §103(a), over Sampath (U.S. Patent Publication No. 2003/0012308) in view of Moose (U.S. Patent Publication No. 2002/0065047).

Arguments

1.) Claims 26-39, 46 and 47 Are Patentable Over Sampath In View Of Moose

The Examiner has maintained the rejection of claims 26-39, 46 and 47 as being unpatentable over Sampath (U.S. Patent Publication No. 2003/0012308) in view of Moose (U.S. Patent Publication No. 2002/0065047). The Applicants traverse the rejections.

a.)   Office Action dated June 10, 2009

The Examiner first rejected claims 26-39, 46 and 47 as being unpatentable over Sampath in view of Moose in an Office Action dated June 10, 2009, to which the Applicants responded:

Claim 26 recites:

> 26.   A method <u>in a receiver unit</u> to <u>receive communication signals</u> from a transmitter unit via a multi-path channel, said method comprising the steps of:
>
> estimating parameters of a channel filter function of said channel <u>from said received communication signals</u> from the transmitter unit;
>
> sub-dividing the channel filter function into two or more parts, a function of which representing an approximation of the estimated full channel filter function;
>
> representing the complex parameters of at least a selection of said parts of the channel filter function as actual parameter values, or as incremental values indicating the difference to a reference value; and,
>
> composing a channel measurement message <u>to be transmitted to the transmitter unit</u> of a portion including said parameter representations and a portion indicating the manner of representing said parameters. (emphasis added)

As recited in claim 26, the Applicants invention is directed to a method <u>in a receiver unit</u> to receive communication signals *from* a transmitter unit via a multi-path channel. Parameters of a channel filter function are estimated as a function of <u>received</u> communication signals *from* the transmitter unit, performing additional processing functions, then composing a channel measurement message to be <u>transmitted</u> *to* the transmitter unit.

In rejecting claim 26, the Examiner relies solely on the teachings of Sampeth except with respect to the claim limitation relating to "incremental values indicating the difference to a reference value." Although the Examiner begins by asserting that Sampeth discloses "a method in a <u>receiver</u> unit" (emphasis added), he then proceeds to map the elements of claim 26 onto various portions of Sampeth that relate to a <u>transmitter</u>. For example, with respect to the claimed function of "sub-dividing the channel filter function into two or more parts," which is performed in the claimed receiver unit, the Examiner states that Sampeth, in paragraph 26, "explains that the base station

controller 102 controls the <u>transmit</u> antenna 111 to <u>transmit</u> a signal . . ." (emphasis added) The Examiner then proceeds, on page 4 of the office action, to twice repeat various statements regarding the teachings of Sampeth, referring to paragraphs 27 and 28 thereof, <u>without connecting such teachings to any particular element of claim 26</u>. Although the Examiner states that "[i]n OFDM systems, the *bandwidth* is divided into narrow frequency bands" (emphasis added), as stated in paragraphs [0007] and [0024] of Sampeth, the Applicants can find no teaching therein (as confirmed by an electronic search) of any teaching relating to "sub-dividing [a] *channel filter function* into two or more parts, a function of which representing an approximation of the estimated full channel filter function." Therefore, the Examiner has not established a *prima facie* case of obviousness of claim 26.

b.)   Final Office Action dated December 16, 2009

In a Final Office Action dated December 16, 2009, the Examiner maintained the rejection of claims 26-39, 46 and 47 as being unpatentable over Sampath in view of Moose. The Applicants, again, traversed the rejections, to wit:

Claim 26 recites:

> 26.   A method <u>in a receiver unit</u> to <u>receive communication signals</u> from a transmitter unit via a multi-path channel, said method comprising the steps of:
> estimating parameters of a channel filter function of said channel <u>from said received communication signals</u> from the transmitter unit;
> sub-dividing the channel filter function into two or more parts, a function of which representing an approximation of the estimated full channel filter function;
> representing the complex parameters of at least a selection of said parts of the channel filter function as actual parameter values, or as incremental values indicating the difference to a reference value; and,
> composing a channel measurement message <u>to be transmitted to the transmitter unit</u> of a portion including said parameter representations and a portion indicating the manner of representing said parameters. (emphasis added)

As recited in claim 26, the Applicants invention is directed to a method *in a receiver unit* to receive communication signals *from* a *transmitter* unit via a multi-path channel.

Parameters of a channel filter function are estimated as a function of communication signals **_received_** **_from_** the **_transmitter_** unit, performing additional processing functions, then composing a channel measurement message to be **_transmitted_** from the claimed receiver to the transmitter unit that transmitted the received signal on which the channel measurement message is based. The processing functions include: sub-dividing the channel filter function into two or more parts, a function of which representing an approximation of the estimated full channel filter function; and, representing the complex parameters of at least a selection of said parts of the channel filter function as actual parameter values, or as incremental values indicating the difference to a reference value. That combination of functions is not taught by Sampeth and Moose, either individually or in combination.

Examiner's Response to Arguments

In responding to Applicants prior arguments [to the Office Action dated June 10, 2009], the Examiner merely assert[ed] that "Applicant argues . . . [that] Sampeth does not disclose sub-dividing the channel filter function into two or more parts, a function of which representing an approximation of the estimated full channel filter function," which the Examiner then asserts is taught with respect to Figures 5 and 6 of Sampeth. The Examiner's response fails to address Applicants' arguments in two respects.

First, in the Examiner's stated reasons for the rejection of claim 26, in both the prior and present office action, he refers to paragraphs 26, 27 and 28 to support his assertion that that limitation of claim 26 is taught by Sampeth. In response, the Applicants previously noted that no teaching (as confirmed by an electronic search) can be found in Sampeth relating to "sub-dividing [a] *channel filter function* into two or more parts, a function of which representing an approximation of the estimated full channel filter function." Although the Examiner notes that the Applicants "are reminded that the rejection is made based on the entire content of the cited prior art," the Applicants wish to remind the Examiner that it is the duty of the Examiner to establish a *prima facie* case of obviousness. The Examiner's reliance in the present, final, office action on Figures 5 and 6, however, fails to cure the previously-noted deficiency of Sampeth; nothing in Figures 5 and 6, or the description relating thereto, appears to teach sub-dividing a channel filter

function into two or more parts, a function of which representing an approximation of the estimated full channel filter function.

Second, the Examiner's "Response to Arguments" in the present office action wholly fails to address the additional argument posited by the Applicants in the prior response. As previously noted, the Examiner has relied solely on the teachings of Sampeth except with respect to the claim limitation relating to "incremental values indicating the difference to a reference value." Although the Examiner asserts that Sampeth discloses "a method in a **receiver** unit" (emphasis added), he then proceeds to map the elements of claim 26 onto various portions of Sampeth that relate to a **transmitter**. For example, with respect to the claimed function of "sub-dividing the channel filter function into two or more parts," which is performed in the claimed **receiver** unit, the Examiner states that Sampeth, in paragraph 26, "explains that the base station controller 102 controls the **transmit** antenna 111 to **transmit** a signal . . ." (emphasis added) The Examiner then proceeds to twice repeat various statements[1] regarding the teachings of Sampeth (referring to paragraphs 27 and 28 thereof), **without connecting such teachings to any particular element of claim 26**. The Examiner has not responded to the foregoing arguments, **previously submitted by the Applicants**, and, therefore, still has not established a *prima facie* case of obviousness of claim 26.

c.   **Advisory Action dated March 1, 2010**

In an Advisory Action dated March 1, 2010, the Examiner responded to Applicants' foregoing arguments without addressing the first point; *i.e.*, that there is no teaching in Sampeth (as confirmed by an electronic search) relating to "sub-dividing [a] *channel filter function* into two or more parts, a function of which representing an approximation of the estimated full channel filter function." None of the Office Action dated June 10, 2009; the Final Office Action dated December 16, 2009; or the Advisory Action dated March 1, 2010, clearly points to any teaching in Sampeth of the combined functions in a receiver, when receiving communication signals from a transmitter unit via a multi-path channel, of:

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[1] See page 4 of the prior and present office actions, wherein the Examiner repeats that "paragraph #27 explains that . . . " with respect to different claim limitations, as well as repeats "paragraph#28 explains that . . " with respect to further different claim limitations.

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1.) estimating parameters of a channel filter function of said channel from said received communication signals from the transmitter unit;

2.) sub-dividing the channel filter function into two or more parts, a function of which representing an approximation of the estimated full channel filter function;

3.) representing the complex parameters of at least a selection of said parts of the channel filter function as actual parameter values, or as incremental values indicating the difference to a reference value; and,

4.) composing a channel measurement message to be transmitted to the transmitter unit of a portion including said parameter representations and a portion indicating the manner of representing said parameters.
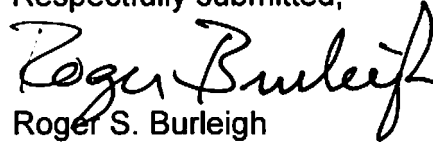
Accordingly, the Examiner has not established a *prima facie* case of obviousness for claim 26. Whereas independent claim 46 recites limitations analogous to those of claim 26, it is also not obvious over Sampeth in view of Moose. Furthermore, whereas claims 27-39 and 47 are dependent from claims 26 and 47, respectively, and include the limitations thereof, they are also not obvious in view of those references.

* * *

CONCLUSION

The claims currently pending in the application are patentable over the cited references, and the Applicants request that the Examiner's claim rejections be reversed and the application be remanded for further prosecution.

Respectfully submitted,

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Date: _____May 17, 2010_____

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CLAIMS APPENDIX

1-25.   (Cancelled)

26.   (Previously Presented)   A method in a receiver unit to receive communication signals from a transmitter unit via a multi-path channel, said method comprising the steps of:

estimating parameters of a channel filter function of said channel from said received communication signals from the transmitter unit;

sub-dividing the channel filter function into two or more parts, a function of which representing an approximation of the estimated full channel filter function;

representing the complex parameters of at least a selection of said parts of the channel filter function as actual parameter values, or as incremental values indicating the difference to a reference value; and,

composing a channel measurement message to be transmitted to the transmitter unit of a portion including said parameter representations and a portion indicating the manner of representing said parameters.

27.   (Previously Presented)   The method according to claim 26, wherein said function performs a summing of the sub-divided parts of the channel filter function.

28.   (Previously Presented)   The method according to claim 26, wherein the sub-divided parts of the channel filter function comprise channel information of a ranked degree of significance.

29.   (Previously Presented) The method according to claim 26, wherein the channel filter function is represented as a channel impulse response in the time-domain.

30.   (Previously Presented)   The method according to claim 29, wherein the complex parameters of the channel impulse response are reproduced as amplitude and phase values.

31.   (Previously Presented)   The method according to claim 29, wherein the primary sub-divided filter function includes a representation of one or more of the most significant channel components.

32.   (Previously Presented)   The method according to claim 31, wherein the most significant channel component is the component having the shortest delay.

33.   (Previously Presented)   The method according to claim 26, wherein the channel filter function is represented as a channel frequency response in the frequency-domain.

34.   (Previously Presented)   The method according to claim 33, wherein a complex parameter of the channel frequency response is reproduced at least as an amplitude value and optionally by an additional phase value.

35.   (Previously Presented)   The method according to claim 26, wherein the complex parameters of said parts of the channel filter function are represented by their actual values in case of a significant change compared to a previous reference value.

36.   (Previously Presented)   The method according to claim 35, wherein the reference value corresponds to a previous channel parameter representation.

37.   (Previously Presented)   The method according to claim 35, wherein the reference value corresponds to a modelled estimate of the channel filter function.

38.   (Previously Presented)   The method according to claim 37, wherein the modelled estimate is a interpolation of the channel filter function from the complex parameters of the channel filter function.

39.   (Previously Presented)   The method according to claim 37, wherein said modelled estimate of the channel filter function has been received by the transmitter unit.

40-45. (Cancelled)

46.   (Previously Presented)   An apparatus for processing communication signals received via a multipath channel, comprising:

means for estimating parameters of a channel filter function of said channel from said received communication signals from the transmitter unit;

means for sub-dividing the channel filter function into two or more parts, a function of which representing the estimated full channel filter function;

means for representing the complex parameters of at least a selection of the sub-divided channel filter function as actual parameter values, or as incremental values indicating the difference to a reference value; and,

means for composing a channel measurement message to be transmitted to the transmitter unit including said set of parameter representations and a header field indicating the manner of representing said parameters.

47.   (Previously Presented)   The apparatus according to claim 46, which is integrated in a mobile user equipment.

48-50. (Cancelled).

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EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.